

REPLACED BY
ART 34 AMDT

Patent claims

1. A transistor

- with an emitter (1), a collector (2), and a base layer (3),

- wherein the emitter (1) extends into the base layer (3),

- wherein the base layer (3) has an intrinsic region (4) arranged between the emitter (1) and the collector (2), and an extrinsic region (6) that runs between the intrinsic region (4) and a base contact (5),

- wherein the base layer (3) contains a first doping layer (7) doped with a trivalent doping substance, which extends into the extrinsic region (6) and which is counter-doped by means of a pentavalent counter-doping substance (8) in the region of the emitter (1).

2. A transistor according to claim 1, wherein the trivalent doping substance is boron.

3. A transistor according to one of the preceding claims,

- wherein two additional doping layers (9, 10) doped with a trivalent doping substance are arranged between the first doping layer (7) and the collector (2),

- and wherein the doping-substance concentration (C2) of the second doping layer (9) arranged between the first doping layer (7) and the third doping layer (10) is less than the doping-substance concentration (C1) of the first doping layer (7) and less than the doping-substance concentration (C3) of the third doping layer (10).

4. A transistor according to one of the preceding claims,
- wherein the first doping layer (7) has a proportion of at least 30% of the total
amount of doping substance of the base layer (3).

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5. A transistor according to one of the preceding claims, wherein the counter-
doping substance (8) is diffused into the base layer (3) from an emitter region (11) that
borders on the base layer (3).

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6. A transistor according to one of the preceding claims, wherein carbon atoms are
built into the base layer at a concentration $> 1 \times 10^{18} \text{ cm}^{-3}$.